COMMUNITY POLLUTION SURVEY

TROUT LAKE

CITY OF NORTH BAY

June 1 - August 28, 1981

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MINISTRY OF THE ENVIRONMENT

Ontario
Ministry of the Environment

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COMMUNITY POLLUTION SURVEY

TROUT LAKE

CITY OF NORTH BAY

1981

Prepared by:

Ministry of the Environment,
Northeastern Region,
North Bay District,
Municipal & Private Abatement

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INTRODUCTION

Trout Lake is located east of the City of North Bay, Ontario. It serves as the municipal water supply for the City, as the private water supply for many of the permanent and recreational dwellings around the lake, and as a high quality recreational area. (see map, Fig. 1).

Concern for the quality of the lake water prompted the undertaking of an evaluation of the private sewage disposal systems along the lakeshore during summer, 1981. This concern is shared by many of the local residents for a number of reasons, including:

1. The lack of municipal sewers servicing the lakeshore area, necessitating the use of private sewage disposal systems.

2. The unsuitability of many lakeshore lots for private sewage disposal systems due to the topography and/or small lot sizes.

3. The advanced age of many of the lakeside dwellings and their associated sewage disposal systems, and

4. Persistent rumours of inadequate or nonexistent sewage disposal system - "direct pipe into the lake".

The survey was done in three phases. Phase I involved Anita Avenue. Phase II combined Silver Lady Lane, a private road off Highway 63 between Anita Avenue and Silver Lady Lane, Wild Cherry Lane, and the part of Peninsula Road adjacent to Wild Cherry Lane. Phase III included Reynold's Road and West Peninsula Road. In total, the survey encompassed the built-up section of Trout Lake's north shore from Delaney Bay to Lounsbury Bay, inclusive. Only those dwellings on the lakeside of the roads were inspected.

The survey did not include all residences around the lake.

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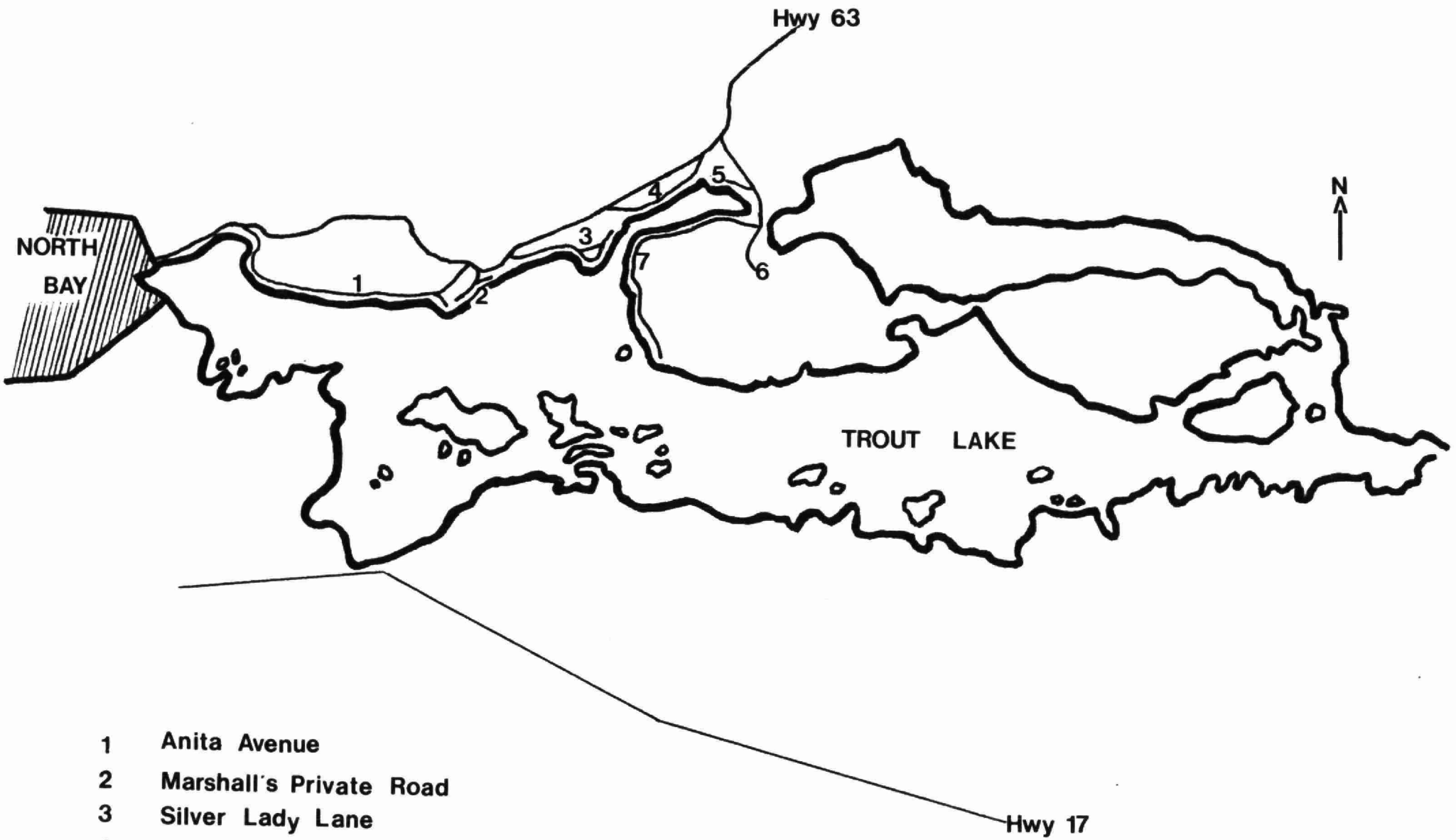

1 Anita Avenue
2 Marshall's Private Road
3 Silver Lady Lane
4 Renyold's Road
5 Wild Cherry Lane
6 Peninsula Road
7 West Peninsula Road

Scale 1: 50,000

FIGURE 1

SURVEY TECHNIQUES

Maps of the areas to be surveyed were obtained and used as aids in orientation and to plot the progress of the study.

Each dwelling was visited and the occupant interviewed. The basic information obtained was that required by the Cottage Pollution Control Program form (Fig. 2). Any additional pertinent information or explanation was also noted. Sketches were made of each property to show the topography and the relative locations of structures, sewage disposal facilities, water supplies, lot boundaries, and the lake. Where an interview was unable to supply all of the required information, efforts were made to obtain it elsewhere. Neighbours and previous owners were helpful in this respect.

A visual inspection of each property was carried out to determine if there were any surficial indications of sewage disposal system malfunctions. Wherever a problem was suspected, or at the request of the dwelling's occupant, dye tests were performed.

Water samples for bacteria tests were taken at selected locations, such as the outfalls of pipe that drained into the lake, and suspect points along the shoreline. The results were used as indications of areas where the sewage disposal systems required more detailed inspection. Sample bottles were left with interviewees who wished to have their drinking water tested, with the request that they inform the investigators of the results should they desire an interpretation.

When inspection of each property was completed, the sewage disposal system was classified as to its performance and the owner notified by letter (see Performance Classifications, p.5). Where necessary, the owners were informed of the relevant Regulations, and steps were taken to intiate the correction of any sewage system malfunctions. Owners of those dwellings which had leaching pits serving fixtures

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connected to pressure water systems were advised of the requirement that water from such fixtures be disposed of in a septic tank and tile bed, a holding tank, or a proprietary aerobic system, but that they are not required to upgrade to this standard until a problem arises in the operation of their leaching pit. Any that had substandard (Performance Class 3), nuisance (Performance Class 4 and 5), or direct polluter (Performance Class 6) systems were notified as to the proper means of correction, and steps were taken to initiate such corrections.

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Ontario

COTTAGE POLLUTION CONTROL PROGRAM

ESTABLISHMENT IDENTITY

LAKE OR RIVER No. (1–6) | ESTABLISHMENT SURVEY No. (7–11) | SUB EST No. (12–13) | TRANS CODE (14–15)

ESTABLISHMENT DESCRIPTION

CARD No. 01 (1–2) | HYDRO METER No. (3–17) | DATE OF INSPECTION DAY MONTH YEAR (18–26) | LOT SIZE (27–32) | UNIT OF LOT SIZE SQ FT (40) ACRES (41) | USE (42) | No. OF OCCUPANTS AVERAGE (43–46) MAXIMUM (47–50) | No. BEDROOMS (51–52) | ESTABLISHMENT TYPE (53–54)

ACCESSIBLE BY ROAD No. (55–56)

NAME OF ROAD _____

USE
1 SUMMER ONLY
2 YEAR ROUND
3 SUMMER OCCASIONAL WINTER
4 PREDOMINANT WINTER
5 NOT IN USE—CLOSED
6 UNDER CONSTRUCTION

TYPE OF ESTABLISHMENT		
01 PRIVATE COTTAGE	07 HOTEL/MOTEL	13 BOATHOUSE
02 CABIN ESTABLISHMENT	08 RESTAURANT	14 PERMANENT HOME
03 COTTAGE ESTABLISHMENT	09 STORE	15 CAMPGROUND/ TRAILER PARK
04 CAMP	10 FARMHOUSE	16 OTHER
05 PICNIC AREA/PUBLIC PARK	11 CLUB	
06 MARINA	12 INDUSTRIAL	

ESTABLISHMENT OWNER

CARD No. (1–2) | INITIALS (61–63) | SURNAME (64–80)

TELEPHONE No _____ IF PERSON INTERVIEWED IS NOT OWNER, NAME _____

MAILING ADDRESS

CARD No. 02 (16–17) | OWNER'S PERMANENT MAILING ADDRESS (18–66)

CLASSIFICATION

PRELIMINARY (79) FINAL (80)

1 SATISFACTORY
2 SATISFACTORY PERFORMANCE
3 SERIOUSLY SUBSTANDARD
4 NUISANCE (WASH WATER)
5 NUISANCE (TOILET, SOLID WASTE)
6 DIRECT POLLUTER
7 UNCLASSIFIED TEMPORARILY)
8 UNCLASSIFIED

INITIALS _____

DESCRIPTION OF FACILITIES

CARD No. 03 (1–2)

	FIXTURES & APPLIANCES											TOILETS									
	BATHROOM WASH BASIN	DISHPAN	BATH WITH SHOWER	BATH	STALL SHOWER	KITCHEN SINK	AUTOMATIC DISHWASHER	WASHING MACHINE (Wringer)	WASHING MACHINE (Auto.)	LAUNDRY TUB	GARBAGE GRINDER	STANDARD FLUSH	URINAL	LOW VOLUME FLUSH	PIT PRIVY	VAULT PRIVY	AQUA PRIVY (Pail-a-day)	INCIN. TOILET—GAS	INCIN. TOILET—ELECT	CHEMICAL TOILET	OTHER (Specify)
QUANTITY																					
	18					25						30			35					40	

SLOPE OF LOT GROUND (53–56)

0-5% (Flat)	5-10% (Moderate)	10-20% (Mod Steep)	>20% (Steep)

DRINKING WATER

SOURCE PRIMARY (42) OTHER (43) | SOURCE IF IMPORTED (44) | TREATMENT PRIMARY (45) OTHER (46) | LAUNDRY DONE AT COTTAGE YES (47) NO (48) | PIPED WATER YES (49) NO (50) | REFUSE PRIMARY (51) OTHER (52)

DRINKING WATER SOURCE	
1 LAKE	4 CISTERN FOR RAINWATER
2 COTTAGE DUG WELL	5 MUNICIPAL
3 COTTAGE DRILLED WELL	6 OTHER (SPECIFY)

DRINKING WATER TREATMENT		
1 NONE	5 DISINFECTED BY OTHER MEANS	7 FILTERED AND DISINFECTED BY OTHER MEANS
2 BOILED OR FILTERED AND BOILED	6 FILTERED AND DISINFECTED BY CHLORINE	8 OTHER (SPECIFY)
3 FILTERED		
4 DISINFECTED BY CHLORINE		

REFUSE		
1 TO MUNICIPAL DUMP	4 DEPOSITED IN LAKE	7 BURNED/INCINERATED
2 TO LOCAL DUMP	5 DEPOSITED ELSEWHERE	8 OTHER (SPECIFY)
3 TAKEN HOME	6 BURIED ON LOT	

FIGURE 2

FIGURE 2

SEPTIC TANKS

CARD No 0 4

TANK No | CAPACITY: LIQUID, TOTAL, GALLONS | YEAR INSTALLED | LAST YEAR CLEANED | MATERIAL | APPROVAL | APPROV AGENCY

MATERIAL
1 CONCRETE
2 STEEL
3 FIBERGLASS
4 CONC BLOCK
5 OTHER (SPECIFY)

APPROVAL
1 NO REFERRAL
2 REFERRAL, NOT YET APPROVED
3 NOT APPROVED
4 APPROVED

APP AGENCY
1 HEALTH UNIT
2 MIN OF ENV
3 MUNICIPAL

TILE FIELDS

FIELD No. | TOTAL LENGTH OF TILES (FT.) | DISTANCE BETWEEN LINES (FT.) | HEIGHT ABOVE LAKE (FT.)

BACTERIOLOGICAL SAMPLE RESULTS

CARD No 0 5

TOTAL COLIFORM | FAECAL COLIFORM

1 to 9 — NORMAL LAKE OR RIVER SHORE SAMPLE No.
D — DRINKING WATER
S — SEWAGE SAMPLE
C — CONTROL SAMPLE

EVALUATION OF SYSTEM

CARD No 0 6

DISTANCE TO
1 ALL MEASUREMENTS ARE SHORTEST DISTANCES
2 MEASUREMENT FROM POINT OF WASTE DISCHARGE ON GROUND SURFACE

SYSTEM No | SYSTEM TYPE | LAKE OR RIVER (FEET) | STREAM ON OR ABUTTING LOT (FEET) | DRINKING WELL (FEET) | BUILDING (FEET) | PROPERTY BOUNDARY (FEET) | TYPE OF WASTE: TOILET, BATHTUB, SHOWER, BATHROOM WASH BASIN, KITCHEN, LAUNDRY, UNKNOWN | CONSTRUCTION: POOR, INFERIOR MATERIALS, UNKNOWN CONSTRUCTION | OPER'N: SYSTEM OVERLOADED, SYSTEM ABUSED, UNKNOWN OPERATION | PERF: FIRST, SECOND | SYSTEM CLASSIFICATION

PERFORMANCE
1 POLLUTING DRINKING WELL
2 POLLUTING GROUND WATER
3 PONDING
4 EFFLUENT SURFACING
5 EFFLUENT BREAKING OUT
6 LEAKING
7 BAD ODOUR
8 NOT VERMIN PROOF

SYSTEM TYPE
01 SEPTIC TANK
02 TILE FIELD
03 ON GROUND SURFACE
04 INTO LAKE/RIVER
05 LEACHING PIT
06 PIT PRIVY
07 CESSPOOL
08 HOLDING TANK
09 LAGOON
10 MUNICIPAL
11 REFUSE
12 OTHER (SPECIFY)

SOIL PROFILE

CARD No 0 7

SOIL TYPES
1 ORGANIC
2 GRAVEL
3 SAND
4 SILT
5 CLAY

HOLE 1 (IN TILE FIELD IF ONE EXISTS) | HOLE 2 (IN TILE FIELD IF ONE EXISTS)

SOIL STRATUM (FT.) | MAINLY COMPOSED OF | WITH CONSIDERABLE AMOUNT OF | MINOR AMOUNT OF

FIRST
NEXT
NEXT
NEXT

DEPTH TO IMPERVIOUS LAYER OR DEPTH TO GROUND WATER

SOIL DEPTH RANGE OVER WHOLE PROPERTY FT TO FT

SOIL IS NATURAL | FILL

RECOMMENDED ACTION AND COMMENTS (BY SUPERVISOR)

CARD No 0 8

CARD No 0 9

ESTABLISHMENT IDENTITY

LAKE OR RIVER No | ESTABLISHMENT SURVEY No | SUBJECT No

SEWAGE SYSTEM TYPE CLASSIFICATIONS

A Class 1 sewage system is a privy for the disposal of human body wastes.

A Class 2 sewage system is a leaching pit for the disposal of sink wastes. A pressurized water system is not to be used with a leaching pit.

A Class 4 sewage system is a septic tank and leaching bed.

A Class 5 sewage system is a holding tank for storage or retention of sewage.

A Class 6 sewage system is a proprietory aerobic sewage treatment plant (it requires a leaching bed which is much smaller than a Class 4, but usually more expensive).

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SEWAGE SYSTEM PERFORMANCE CLASSIFICATION

The sewage disposal systems of all the premises surveyed were classified into one of the following categories:

CLASS 1 - SATISFACTORY: The systems presently meet provincial standards relating to materials of construction, sizing, distances from water courses, and were properly maintained as outlined in Regulation 229, of the Environmental Protection Act, 1971.

CLASS 2 - SATISFACTORY PERFORMANCE (ACCEPTABLE): No obvious signs of pollution or of system malfunction were noted at the time of inspection. The disposal system may be antiquated or may not precisely meet regulations, but no faults in operation were observed.

CLASS 3 - SUBSTANDARD: Systems with defects in construction, materials of construction, maintenance, sizing or systems located in poor soil conditions and/or were closer than the required distances to waterbodies. There may be health or environmental concerns.

CLASS 4 - NUISANCE - WASH WATER: A system allowing the disposal of sink water or laundry water onto the ground surface. As well as a potential health hazard, such discharges allow the untreated release of nutrients which may encourage weed growth and affect the aesthetics of the receiving waterbody.

CLASS 5 - NUISANCE - TOILET AND SOLID WASTES: Systems including poorly constructed or maintained privies. Also included in this category are garbage, scrap, etc. which allow conditions suitable for the procreation of vermin.

CLASS 6 - DIRECT POLLUTER: A system permitting human waste to directly enter the groundwater or surface water through piping or runoff on the ground surface, or after minimal (inaequate) treatment.

CLASS 7 - UNCLASSIFIED: Systems which could not be satisfactorily classified due to insufficient information or systems which at the time of inspection were under construction or appeared abandoned.

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PHASE 1

The results of Phase 1 of the survey indicated that 87.18% of the dwellings on Anita Avenue had sewage systems that were performing satisfactorily, (Performance Classes 1 and 2), 3.85% had substandard (Performance Class 3) systems, 2.56% were discharging wash water directly onto the ground surface (Performance Class 4), and 6.42% could not be satisfactorily classified. See Tables 1 and 2 for a summary of inspection results.

Area Description

The first area to be surveyed was Anita Avenue, on the north shore of the lake, off highway 63. The numerous dwellings along this road are built on shore lots which, in general, are narrow and steep with little soil over the bedrock. Many of the dwellings are older cottages that have been renovated and turned into year round residences. Sewage systems for these dwellings are relatively antiquated and would not meet present day Regulations.

Observations and Results

78 dwellings were inspect:
i) 67 permanent homes
ii) 11 recreational cottages

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Table 1

Sewage System Type Classification - Anita Avenue

Type	Class 2 (leaching pit)	Class 4 (septic tank and tile bed)	Class 6 (proprietary aerobic)	Unknown
Number of dwellings with this class of system*	20**	64	7***	3
	25.64%	82.05%	8.97%	3.85%

* some dwellings had more than one system or type of system

** 3 of these receives toilet wastes
2 of these were tile beds, with no associated septic tanks, which received waste water directly

*** 5 aquarobic
2 rotordisk

Table 2

Sewage System Performance Classification - Anita Avenue

Performance	Class 1	Class 2	Class 3	Class 4	Class 7
Number of dwellings given this classification	12	56	3	2	5
	15.39%	71.79%	3.85%	2.56%	6.41%

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PHASE II

As is true of Anita Avenue, the areas included in Phase II are not served by either sanitary sewers or a municipal water supply. Beyond this there are some marked differences between the first and second phase areas regarding their suitability for private sewage disposal systems and the efficiency of such systems. Compared to those on Anita Avenue, the lots in the phase II areas tend to be larger, less steep, and to have a greater depth of soil over the bedrock. Furthermore, the dwellings in the Phase II area are generally newer, and most were built as permanent homes, rather than as recreational cottages later converted into permanent homes.

The result is that most of the Phase II area systems, even those which predate the Regulations 229/74 under the Environmental Protection Act, are of adequate size and can reasonably be expected to perform their intended function.

Observations and Results

65 dwellings were inspected: i) 51 permanent homes
ii) 14 recreational cottages

Table 3

Sewage System Type Classification

Type	Class 1	Class 2	Class 4	Class 5	Class 6	Unknown
No. *	2	6**	52***	2	3****	6
%	3.08%	9.23%	80.00%	3.08%	4.62%	9.23%

* some dwellings had more than one system or type of system
** one of these receives toilet wastes
*** one of these uses leaching pits instead of a tile bed
**** all of these are Aquarobics

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Sewage System Performance Classifications

Performance	Class	Class 2	Class 3	Class 7
Number of dwellings given this classification	12	48	1	4
	18.46%	73.85%	1.54%	6.15%

The results of Phase II indicate that 92.31% of the dwellings in the included area had sewage disposal systems that were performing satisfactorily (Performance Classes 1 or 2), 1.54% had substandard (Performance Class 3) systems, and 6.15% could not be satisfactorily classified.

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PHASE III

The Phase III area, like the previous areas, has neither sanitary sewers nor a municipal water supply, these matters being the responsibility of the dwelling owners. The lots in this area are generally suitable for the operation of private sewage disposal systems in that they are large and either have flat areas or can be terraced. The soil is predominantly sandy, and appears to have substantial depth to the bedrock in most places. With few exceptions, even those sewage disposal systems which predate the present Regulations seem to be adequate.

Observations and Results

48 dwellings inspected: i) 29 permanent homes
ii) 19 recreational cottages

Table 4

Sewage System Type Classification

Type	Class 1	Class 2	Class 4	Class 5	Class 6	Unknown
No. *	7	12**	38		1	4
%	14.58%	25.00%	79.20%		2.08%	8.30%

* some dwellings had more than one system or type of system
** 1 of these was a tile bed

Table 5

Sewage System Performance Classifications

Type	Class 1	Class 2	Class 4	Class 7
No. *	12	31	1	4
%	25.00%	64.58%	2.08%	8.30%

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The results of Phase III indicate that 89.58% of the dwellings in the included area had sewage disposal systems that performed satisfactorily (Performance Classes 1 or 2), 2.08% had nuisance - Wash Water - (Performance Class 4) systems, and 8.3% could not be satisfactorily classified.

BACTERIOLOGICAL SAMPLING

In setting up the guidelines for this survey, the matter of carrying out a shoreline bacteriological survey was considered. However, due to anticipated and actual time constraints, this was not done.

The Ministry did take water samples though, at selected locations such as near the outfall of pipes and in areas where concerns relating to private sewage disposal systems existed. To the satisfaction of the Ministry, sample results did not indicate any elevated coliform * counts (total and faecal) to a degree that would show serious impairment of the lake in the areas sampled.

Coliform counts can be expected in surface waters as these bodies of water are subject to the influence of animal and human activities. It is for this reason that people utilizing surface waters for a drinking supply are advised to treat the water (eg. chlorination) prior to consumption. Criteria for drinking water is less than 2 total coliform and 0 faecal coliform. Even if repeated sampling by a property owner using a lake supply obtained these satisfactory results, the results could change quickly (eg. swimming activities, a sewage system that began to fail, etc.).

* Coliform organisms live in the intestines of man and animals with large numbers excreted with the faeces. Coliforms will be present naturally, therefore, in sewage and in water or soil that has been polluted with sewage wastes. While coliform by themselves are not responsible for disease, their presence (determined by laboratory analysis) is an indication of some degree of pollution.

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Water is tested for total coliform and faecal coliform levels. Total coliform, as mentioned, will be present in animal/human wastes, but are also found in soil and on vegetation. Faecal coliform are only found in the intestinal contents of warm-blooded animals. The presence of faecal coliform is more likely to represent sewage contamination and is of greater concern because of the risk of disease agents (associated with coliform) also being present in the water is higher. Faecal coliforms tend to die more rapidly outside the body, consequently their presence in water indicates relatively close and recent contamination. No one should drink water containing faecal coliform in any number.

Water quality criteria for recreational uses such as swimming, allow the presence of some coliform. Water tested as having a total coliform count not exceeding 1000 and a faecal coliform count of 100 is acceptable. Samples taken during this survey indicated coliform counts within these limits.

It should be pointed out that "one time" sampling only indicates the bacteriological quality at that time and at a particular location. However, based on the samples taken during this survey and a comprehensive water quality study * completed by the Ministry of the whole of Trout Lake in 1979, one can conclude that Trout Lake is an excellent body of water.

* Copies of the study report entitled "The Water Quality of Trout Lake, North Bay - M.O.E. 1979" can be obtained through the Ministry of the Environment.

Also as a courtesy to the cottagers and homeowners visited during the survey, bacteriological sample bottles were left with them so that they do their own sampling of their drinking water. Since the majority of the residents took their water from the lake, they availed themselves of this service, with the Ministry interpreting the results when requested.

SUMMARY

The survey revealed that most dwellings had satisfactory sewage disposal systems. Notably, Anita Avenue was found not to be as poorly serviced as most people believed. This is not to say that all of the systems were above reproach, but that few appeared to pose immediate health or environmental concerns. Those that were obviously faulty have been repaired or replaced.

Unfortunately, the survey came under some criticism from the public for not finding as many faulty systems as the public believed there to be, and for not causing more systems to be replaced. However, there were temporal and methodological limitations on the survey, and the results must be interpreted in light of these limitations.

The records of sewage disposal system installations go back only a few years. Therefore, for descriptions of the older systems which predate the present standards and sometimes were of questionable adequacy, information from the owners or neighbours had to be relied on. This left open the possibility of error or deliberate deception in the description. Furthermore, some of the dwellings had changed hands numerous times and all knowledge of the type and/or location of the systems had been lost.

The performance of some systems inspected was listed as unknown despite their being known or rumoured to be inadequate. This was due to the dwelling being unoccupied and the systems not being used during the survey, so that any problems in the systems' operation would not be apparent.

Most significantly, a faulty sewage system could only be detected if there was some superficial indication of the fault, as owners could not be required to expose their systems for inspection if no fault was apparent. It is then possible that some of the systems classified as having satisfactory

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performance could be poorly designed or malfunctioning and causing pollution by underground seepage.

Such seepage might be detectable through the use of dye, but to test all or even a large proportion of the dwellings inspected would be impractical. The time taken for the dye to reach the lake is highly variable, and the source may be difficult to pinpoint if dye enters the lake in an area where more than one dwelling has been dye-tested. This makes it necessary to perform such dye tests individually over a longer period of time than was available.

It should also be understood that the operating efficiency of the sewage disposal systems was determined during only the one inspection. It is conceivable that as this report is being prepared, sewage systems could be beginning to fail. If that happens, this Ministry hopes that homeowners will contact the Ministry office for advice as to necessary repairs. We also hope that faulty systems will be brought to our attention by means of complaints. All complaints are treated in confidence.

To conclude, the co-operation of the surveyed residents is appreciated.

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